



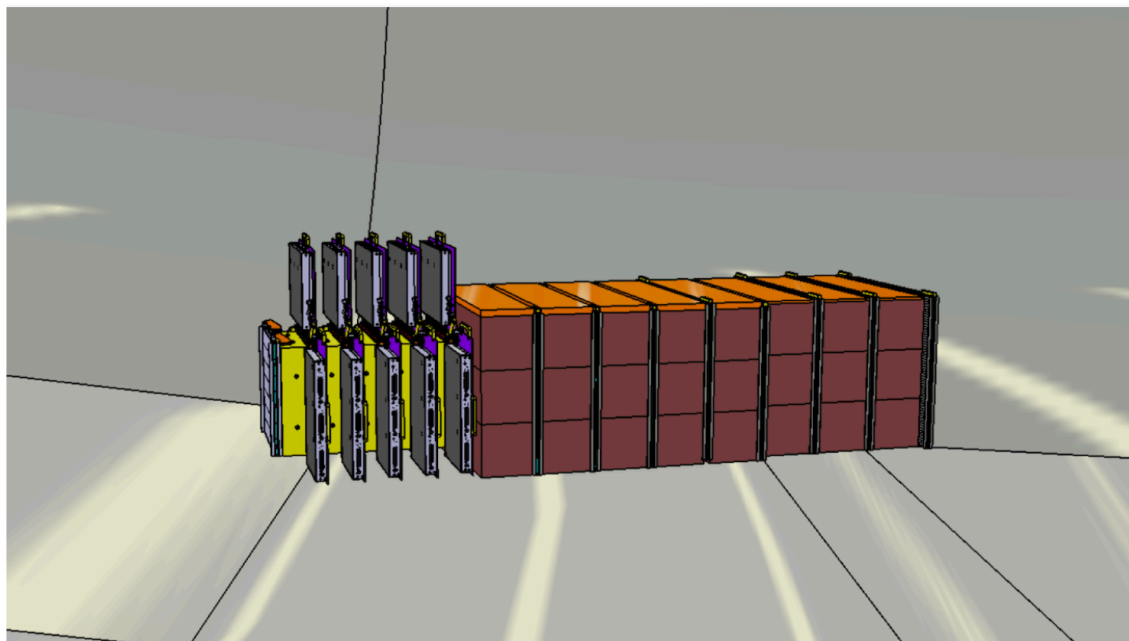
SND@LHC

Scattering and Neutrino Detector at the LHC

CERN approves new LHC experiment

SND@LHC, or Scattering and Neutrino Detector at the LHC, will be the facility's ninth experiment

27 AVRIL, 2021 | Par Ana Lopes



The SND@LHC experiment consists of an emulsion/tungsten target for neutrinos (yellow) interleaved with electronic tracking devices (grey), followed downstream by a detector (brown) to identify muons and measure the energy of the neutrinos. (Image: Antonio Crupano/SND@LHC)

- Proposal, Feb 2020 (by **SHiP** Coll.)
CERN-LHCC-2020-002
- Letter of Intent, Aug 2020
CERN-LHCC-2020-013
- Technical Proposal, Jan 2021
CERN-LHCC-2021-003
- CERN RB approval, Apr 2021
as the **9th LHC experiment**
- MoU for construction, ongoing

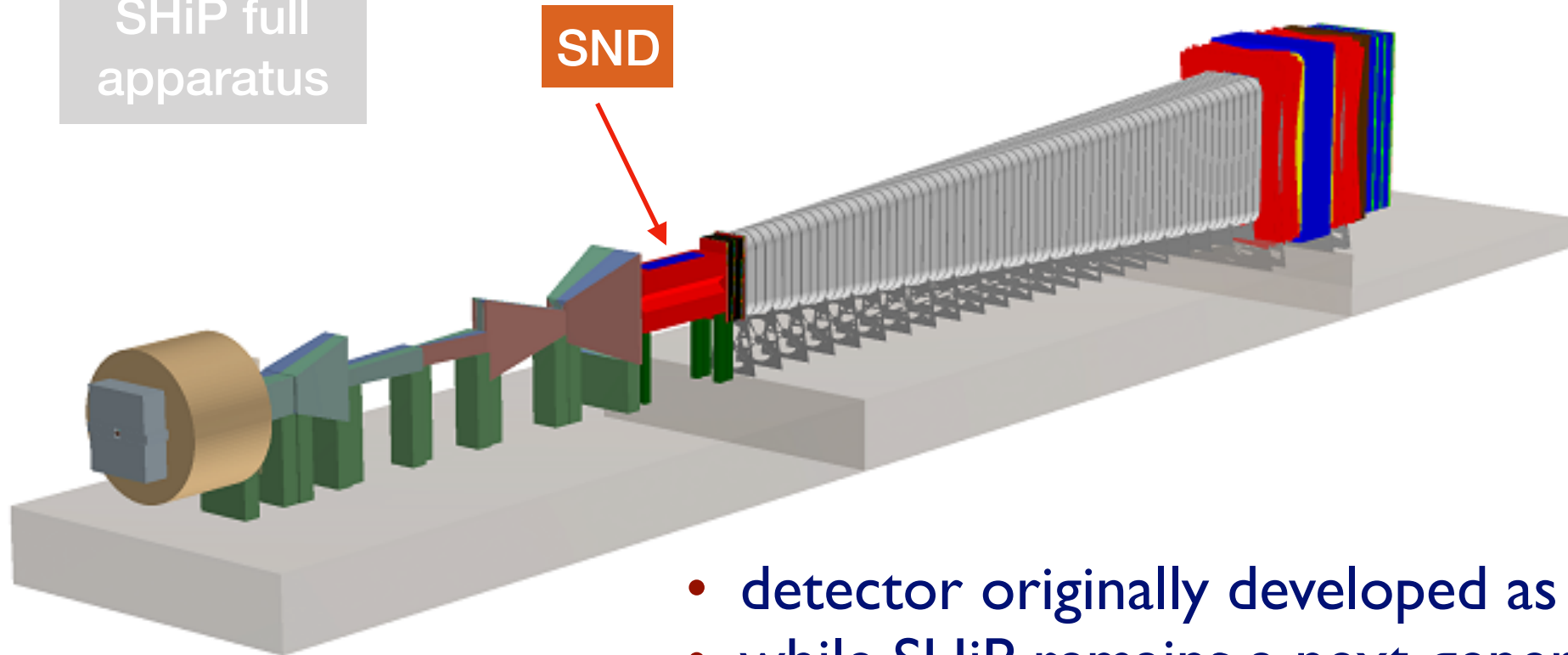
LIP outreach: <https://www.lip.pt/?section=press&page=news-details&id=979>

LIP CC: status reported at previous CC & C4 meetings

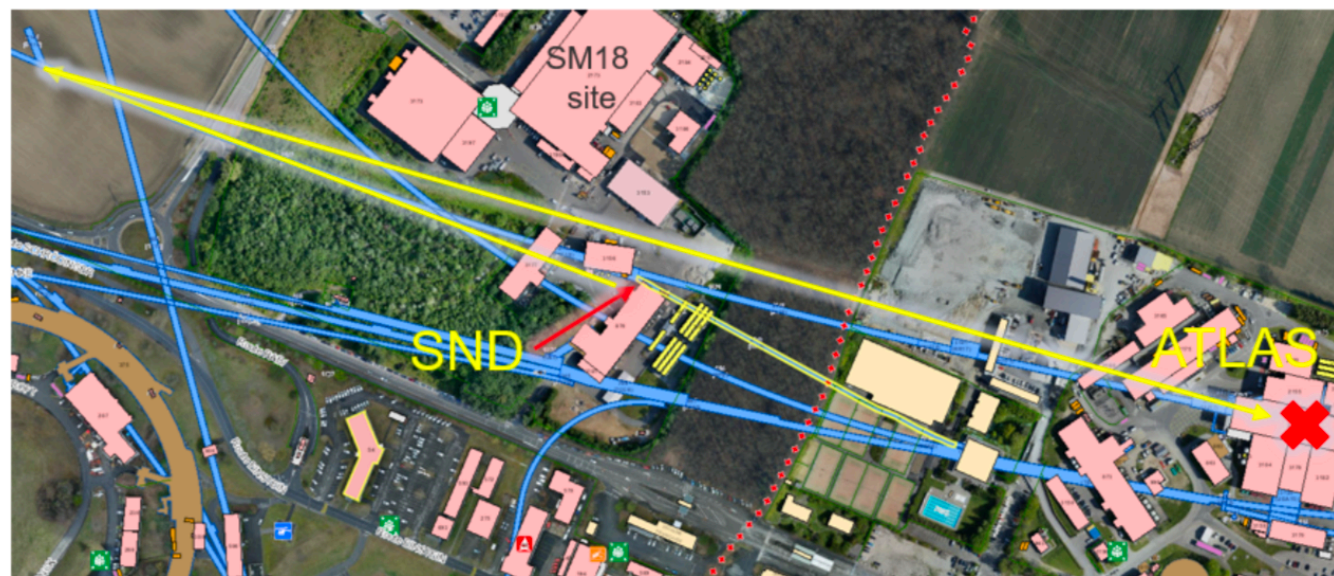
LIP C4 meeting, 19/7/2021

SHiP full
apparatus

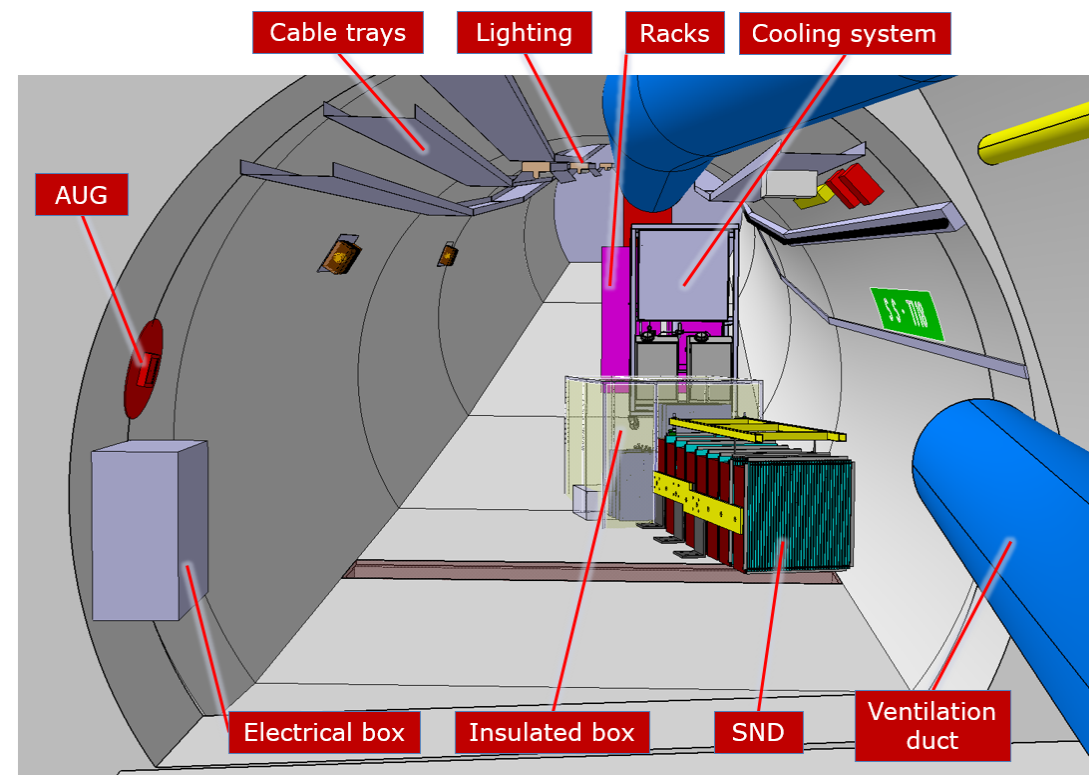
SND



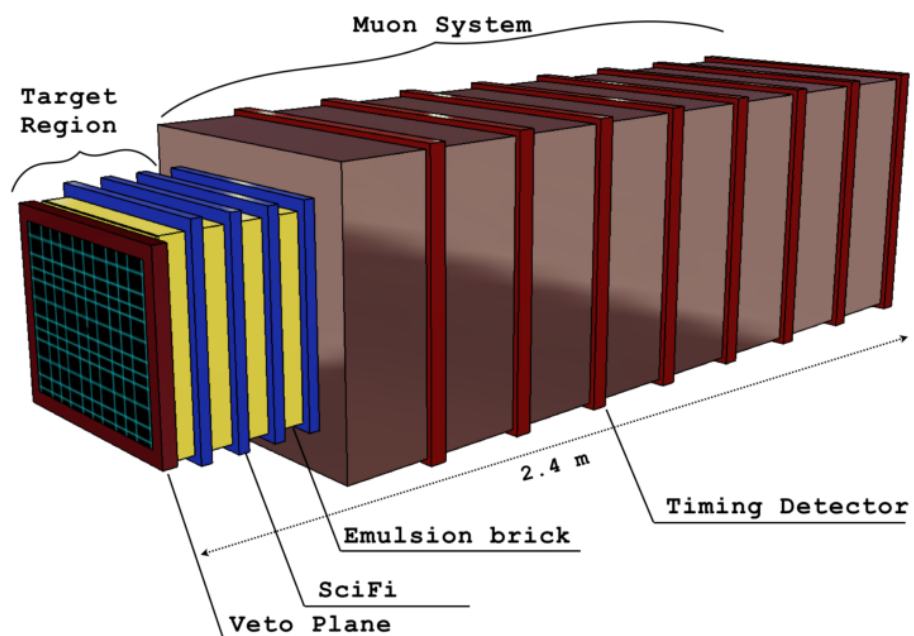
- detector originally developed as sub-detector of SHiP
- while SHiP remains a next-generation experiment
- SND@LHC is **being built now** (at ~1% of SHiP's cost)



to be installed @ CERN tunnel TI18
480m from ATLAS IP ('off-axis')



The Detector



The Physics

Detect **collider neutrinos** for first time

(sensitivity to all 3 flavours)

Energy range so far unexplored (350GeV—10**TeV**)

Measure **HF production** in so-far unexplored region
(not covered by any other LHC experiment)

Lepton Flavour Universality (**LFU**) tests

Search for **FIPs** and Light **Dark Matter**

➔ **Extends exploration potential of (HL)LHC**

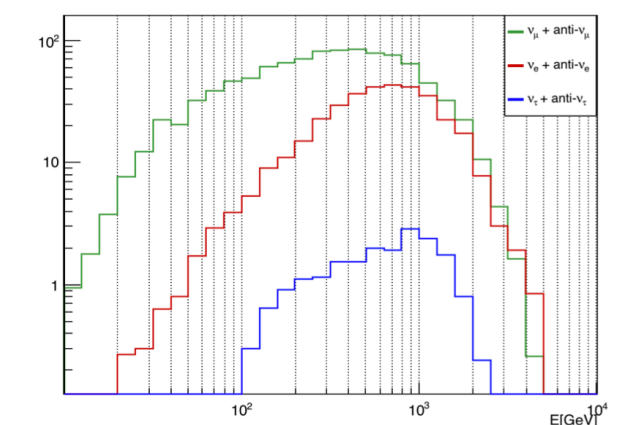
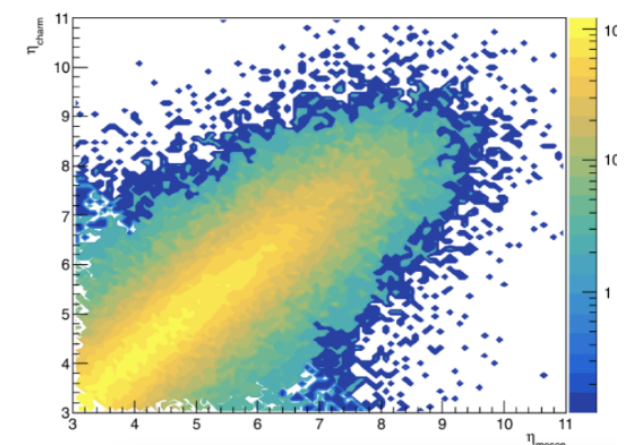
Production, June 2021 @ **LIP**

Assembling, July 2021 @ **CERN**

towards **Physics @Run3**



(G.Soares)



SND@LHC Collaboration

~200 members

~ 20 institutes

Stem from SHiP Coll.

other institutes join(ing)

Europe

Asia

America

SND@LHC@LIP

= SHiP Group (currently)

A.Blanco, P.Bordalo, N.Leonardo,
L.Lopes, S.Ramos, J. Saraiva, G.Soares

Internship students:

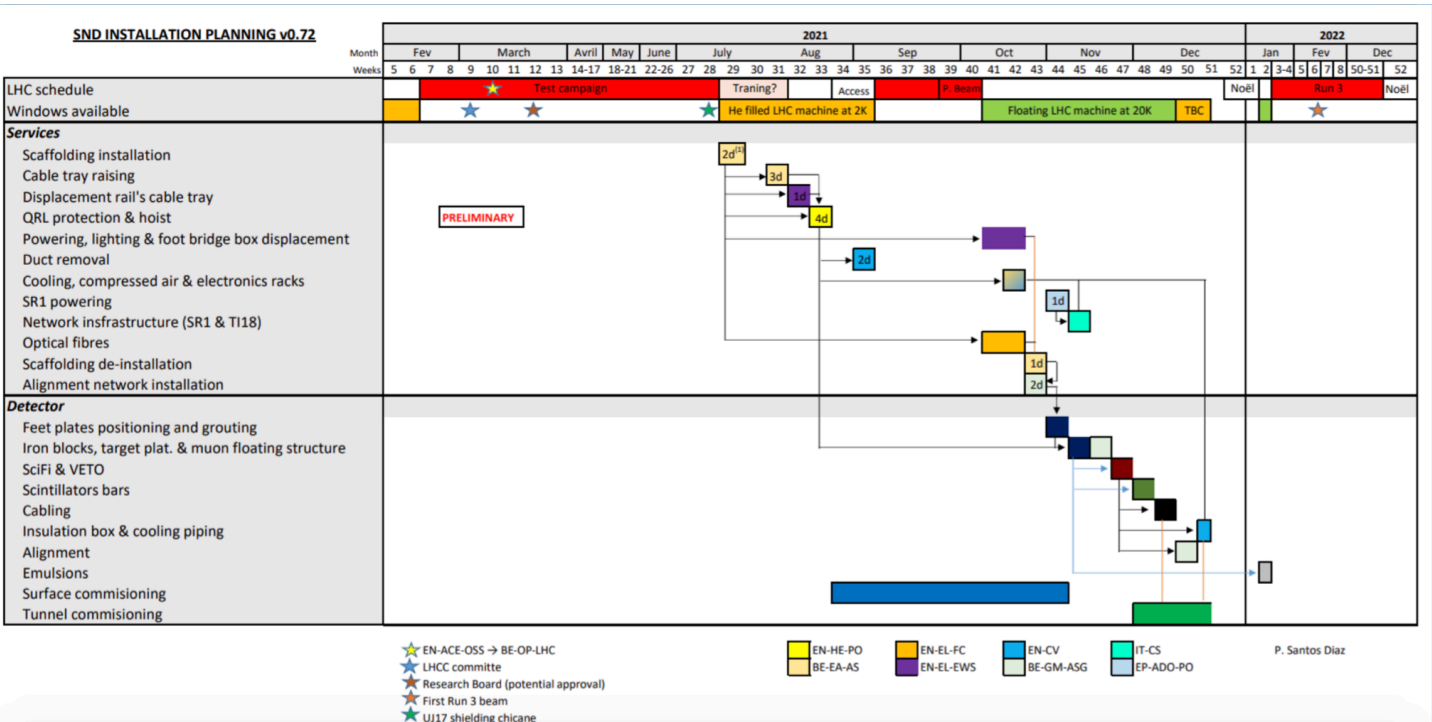
A.Branco, F.Safara, H.Santos, R.Santos

Interested collaborators welcome!

Natural connection and synergy with various other Groups & Infrastructures @LIP

Opportunities to contribute to novel Detector & Physics in challenging LHC environment

Installation Schedule for infrastructure and detector



Institutes participating in construction

Chile	SAPHIR
Germany	Humboldt University of Berlin
Germany	University of Mainz
Italy	INFN
Japan	JSPS
Korea	NRF (National Research Foundation of Korea)
Portugal	LIP
Russia	Ministry of Science and Higher Education MISiS
Switzerland	EPFL
Switzerland	University of Zurich
Turkey	METU
UK	Imperial College London (ICL)
-	CERN